CSCE 790-002, Fall 2017
Homework 2, due September 28, 2017

Reading

Reading in KLM is primary, and my course notes are secondary. Reading my course notes will likely be helpful in filling in some background, and I will draw some exercises from the notes (KLM seems to have a dearth of exercises).

- KLM, rest of Chapter 2. If you want to see a complete proof of the Spectral Theorem (KLM Theorems 2.4.2 and 2.4.3), look at the Background Material supplied with my course notes (http://www.cse.sc.edu/~fenner/csce790/notes/background.pdf).
- KLM, Chapter 3, Sections 3.1 and 3.2
- Course notes, Lectures 4, 5, 6, 7

Written Exercises

1. Show that in any vector space $V$, if $u_1, \ldots, u_k \in V$ are vectors and \{\$u_1, \ldots, u_k\}$ is linearly independent, then \{\$u_1, \ldots, u_k, u_{k+1}\}$ is also linearly independent for any $u_{k+1} \in V - \text{span}\{u_1, \ldots, u_k\}$.

2. Do Course Notes Exercises 4.2, 5.3, 5.4, 5.7, 5.8, 5.9, 5.11, 5.12, 7.2, 7.3.

Note: Here are some more notational discrepancies between my lecture/notes and the book:
1. If $E$ is some expression representing a matrix, then I use $[E]_{ij}$ to denote the $(i, j)$th entry of $E$. This is useful particularly when $E$ is an expression of any complexity, because it does not require coming up with a new letter to represent the matrix.

2. I always use $\langle \cdot | \cdot \rangle$ in the notes to denote the inner product in a Hilbert space, whereas KLM at one point uses $\langle \cdot , \cdot \rangle$ when wanting not to use Dirac notation. My convention is not necessarily better or worse—just different.